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DISEASES WHICH KILL MORE WOMEN THAN MEN.

The deathrates for the great majority of the important diseases are higher among men than among women.

There are, nevertheless, a number of diseases, which, year after year, record relatively higher mortality among girls and women. In most such cases the reason for the excess is obvious. Certain diseases, including cancer, organic heart disease, and apoplexy, show higher deathrates among women because this sex has the longer average life span and more women than men live to reach those mature ages where most of the deaths from cancer, cardiac conditions, and apoplexy occur.

There are, however, a number of other diseases which show, year after year, higher deathrates among females, and for which the reason is by no means clear. The figures for whooping cough, for example, have shown a higher incidence among girls than among boys, which is contrary to what occurs with measles, scarlet fever, and diphtheria—the other principal epidemic diseases of childhood.

Then again, tuberculosis of the intestinal tract, contrary to other forms of tuberculous diseases, kills more women than men. We have never seen a satisfactory explanation for this phenomenon. It is a fact, however, that the excess in the female mortality is confined to the age periods between ten and fifty years; and this suggests that the sex difference *may* be due to conditions related to maternity. There is also a possible relationship between non-puerperal diseases of the female genitals and intestinal tuberculosis. It has been suggested by one authority that some diseases of the female sex organs reduce the powers of resistance and enable the bacillus of tuberculosis to gain a foothold. In such cases tuberculous peritonitis often follows diseases of the uterus and adjacent organs.

In the United States, women suffer from pellagra to a far greater extent than men. The susceptibility of the former is far more pronounced in America than in Europe. The great preponderance of females over males and the much higher mortality call for explanation. The difference is not so pronounced after age 55 as at the younger ages.

Affections of the endocrine glands, (the thyroid, the parathyroid, the pituitary, the adrenal, and the pancreas) uniformly cause much higher mortality among females. Women are much more frequently attacked and this is especially true of all forms of goitre. In Addison's disease, a rare affection of the suprarenal capsule, males are more frequently attacked than females, but females, on the other hand, show the higher deathrate.

Diabetes is a disease with a most decided sex incidence. We have frequently commented on the favorable turn in the mortality from this disease, as shown in 1923 and the early months of 1924. When figures are available by sex, it will be interesting and important to determine whether this decline in the deathrate has occurred in each sex; for it is a fact that in diabetes mellitus, men are more frequently affected than women—at least more men than women are *treated* for diabetes—but more women than men *die* of the disease. On the face of these data a first-hand deduction would be that the disease has a much higher case-fatality rate among women. One prominent authority on diabetes, however, suggests that the apparent preponderance of the disease in men may be due to some extent to the larger percentage of men who are examined by life insurance companies. The result is that with women, much more than with men, the disease goes undetected. He suggests, furthermore, that the fact that more men than women receive special medical treatment for diabetes, and that, at the same time, more women than men die of the disease, is evidence in favor of the effectiveness of the present treatments.

Chorea, or St. Vitus's Dance, a disease that affects children for the most part, is far more prevalent in girls than in boys. It sometimes terminates fatally, and deaths chargeable to it result directly from complications, rather than from chorea itself. It records, year after year, many more deaths among girls than boys and even at the advanced ages, where relatively low mortality occurs, the same strong sex incidence prevails. Mental conditions, except general paralysis of the insane, cause 50 per cent. higher mortality among women than among men.

Anemia, a disease due either to reduction in the amount of blood as a whole, or of the blood corpuscles, or of certain constituents of the blood, is another condition which causes many more deaths among females than males. This is true at every age of life. One type of anemia, known as chlorosis, is, in effect, definitely a disease of girls, the age of onset being usually between the fourteenth and seventeenth year. One prominent medical authority states that it is doubtful if males are ever affected with chlorosis, but he does not venture any opinion as to *why* this is true. One type of anemia, known as pernicious anemia, is more common among males.

Liver and gall-bladder diseases, with the exception of cirrhosis, show, year in and year out, such strong preponderance in female mortality that there can be no doubt whatever of the existence of a definite cause for this phenomenon. In the case of the rare disease, acute yellow atrophy of the liver, the reason for the relatively high female deathrate probably lies in the recognized frequent association of the disease with pregnancy. Pregnancy is also believed by medical authors to be an important factor in causing the high deathrate among women from gall-stones.

Diseases of the veins and chronic bronchitis are two other conditions more fatal to women.

Among deaths caused by violence there is only one kind, burns, which is charged with a higher death toll among girls and women. Three out of every five deaths from this cause are those of females.

The predominance of deaths among this sex may suggest to the clinicians and to the laboratory students of these diseases, relations which will serve as a clue for directing further research. Certainly, these sex differences are not clearly explained, in many instances at least, in medical literature.

EXPECTATION OF LIFE IN THE UNITED STATES DURING 1922 LOWER THAN IN 1921.

A slightly lower expectation of life was recorded in 1922 as compared with 1921. During the latter year the deathrate was the lowest ever experienced in the United States and the expectation of life was the highest. While 1922, itself, was a splendid health year, there occurred nevertheless an influenza outbreak early in the year which caused a sufficient number of deaths from that

disease and its complications to bring about an increase in the mortality for the year as a whole.

Nevertheless, the loss in the life expectation at birth was small, being .12 of a year for both sexes combined, and .21 for males. Females actually showed a gain of .01 of a year, but showed losses at every other age.

Comparison of the life expectation record of the two sexes is altogether favorable to the females. At every age up to and including 82 years they suffered the smaller loss in life expectancy.

In 1921 the gains were most pronounced at the younger ages. In 1922, the greater losses were at ages below 50.

Tables of life expectation relating to single years only should be analysed and interpreted with considerable caution. It should be borne in mind that they merely reflect what has happened from one year to the succeeding one. A life table for 1922 serves chiefly as a means of pointing out the effect of even a relatively mild outbreak of influenza in curtailing the average life span of the people.

The table below presents for selected ages and by sex, a comparison of life expectations in 1921 and 1922:

Expectation of Life in United States Registration States, 1922 and 1921. By Sex.

Age	TOTAL			MALES			FEMALES		
	1922	1921	Gain(+)or Loss(—) 1922-1921	1922	1921	Gain(+)or Loss(—) 1922-1921	1922	1921	Gain(+)or Loss(—) 1922-1921
0	57.89	58.01	— .12	56.81	57.02	— .21	59.07	59.06	+ .01
7	57.30	57.77	— .47	56.76	57.34	— .58	57.90	58.23	— .33
12	52.83	53.41	— .58	52.33	53.03	— .70	53.39	53.81	— .42
17	48.44	49.05	— .61	47.96	48.70	— .74	48.98	49.44	— .46
22	44.33	44.95	— .62	43.85	44.59	— .74	44.88	45.34	— .46
32	36.27	36.89	— .62	35.73	36.46	— .73	36.87	37.34	— .47
42	28.32	28.90	— .58	27.80	28.47	— .67	28.91	29.35	— .44
52	20.74	21.26	— .52	20.28	20.87	— .59	21.26	21.67	— .41
62	13.96	14.44	— .48	13.60	14.12	— .52	14.33	14.74	— .41
72	8.65	8.97	— .32	8.40	8.75	— .35	8.91	9.19	— .28
82	4.98	5.19	— .21	4.86	5.06	— .20	5.10	5.29	— .19
92	2.78	2.96	— .18	2.86	2.92	— .06	2.89	3.02	— .13
102	1.82	1.72	+ .10	1.91	1.64	+ .27	1.78	1.83	— .05

DIABETES DEATHRATES AMONG INDUSTRIAL POPULATIONS OF AMERICAN STATES AND CANADIAN PROVINCES.

We have directed attention in recent BULLETINS to the very favorable developments in 1923 and the early months of 1924 with respect to mortality from diabetes. In 1923, the diabetes deathrate declined among Metropolitan Industrial policyholders after having shown a continuous rise for the three prior years. During the first four months of 1924 it has shown a further reduction over the corresponding period of 1923. These reductions have followed the beginning of the more or less general use of insulin. So far at least, in 1924, the drop is accentuated as the use of the insulin treatment increases; but this must not be considered as the effect of the use of insulin, without further proof.

In view of these facts there is more than usual interest at this time in the diabetes deathrate, and especially in the geographical distribution of the mortality from the disease. Such figures are now available from the 1923 mortality records of approximately fifteen million Industrial policyholders of the Metropolitan Life Insurance Company.*

The lowest diabetes deathrate among American and Canadian urban industrial populations prevails in the Western Provinces of Canada. For this section, the deathrate was only 8.2 per 100,000. Among the 17,000 industrial policyholders in the Province of Saskatchewan not a single death from this disease occurred in 1923. Very low mortality from diabetes was observed also in the Mountain States, the Eastern Canadian Provinces (except Nova Scotia and New Brunswick) and in the Pacific States. The mortality in the East South Central, the West North Central, the West South Central, and the East North Central States, is below the average for the country as a whole, but there are certain states in each of these geographic divisions which show high diabetes rates. Above-average mortality was also recorded in Maryland, the District of Columbia, Florida, Wisconsin, and West Virginia. Very low rates were registered for North Carolina, South Carolina, Arkansas, Tennessee, and Kansas.

The highest diabetes mortality in any geographic division was that for the Middle Atlantic States, (20.8 per 100,000), followed by

*The Industrial policyholders, it should be remembered, live almost altogether in the cities, where they comprise about one-quarter of the entire wage-earning population.

New England, (17.3). The highest rate for any single state was that for Maryland, (23.5), closely followed by New York, (23.1), Rhode Island, (20.5), and Connecticut, (19.4). All of the three Middle Atlantic States, New York, New Jersey, and Pennsylvania, recorded diabetes deathrates well in excess of the average for the United States.

In general, the mortality is higher in the Northern States than in the Southern. There is an important racial factor involved in diabetes. The above-average mortality in such states as New York, New Jersey, Pennsylvania, Connecticut, and Rhode Island, is very possibly due to the relatively large percentage of those of foreign race stocks, more particularly Jews and Irish, who are very susceptible to diabetes. Ordinarily, the lowest rates will be found in those states which have relatively small numbers of foreign race stocks. When there are exceptions to this, it is because the states have large numbers of elderly people in their populations. Such states would naturally suffer high mortality from diabetes because the deathrate for this disease rises with advancing age.

The above comparisons relate to white persons only. The deathrates for the colored urban wage-earners, however, are more than usually instructive because they show that there is by no means so great a difference between the diabetes deathrates of white and colored wage-earners as is shown for the two races in the general population. It is a well-known fact that, as a group, whites suffer higher mortality from diabetes than do colored persons. In the United States Registration Area, which is about half rural, the white diabetes deathrate, year after year, approximates twice that for the colored. No such margin prevails among the wage-earners. In this industrial group as a whole, the white diabetes deathrate exceeded the colored by only 13 per cent. In certain geographic divisions like New England, the Middle Atlantic, the East North Central, the South Atlantic, and the East South Central States, the margin is much smaller, and in quite a number of states, notably Massachusetts, New York, Ohio, Wisconsin, Minnesota, Kansas, Virginia, North Carolina, South Carolina, Alabama, and Oklahoma, the mortality rate of the colored exceeds that of the whites—in some cases by very large margins. These figures thus bring out the important point that the racial difference observed for the population as a whole does not obtain in the urban wage-working population. Possibly this fact will suggest to investigators further lines of research.

THE SEASONAL FACTOR IN MORTALITY.

Interest is being centered more and more upon the seasonal fluctuation of sickness and death and upon the possible influence of weather factors on health conditions. The first quarter of the year in the North Temperate Zone carries with it the heaviest deathrate. From that point onward, the rates of sickness and of death decline to a minimum in the fall months. The figures then gradually rise with the close of the year.

These facts of seasonal variation have been generally appreciated. But, there are many implications which are worthy of detailed treatment. Thus, in a recent BULLETIN, we showed as a result of a study of the mortality of New York City, having in mind the influence of temperature only, that the deathrate varied inversely with the temperature. It was calculated that if the deathrate were always as low as when the temperature averages 65°F., 10 per cent. of the deaths in the city might have been avoided.* Conclusions of this kind are very important. They show the extent to which departures in temperature and other weather elements affect the deathrate and at what times in the year conscious, deliberate attempts should be made by the individual to safeguard himself and the members of his family. Advances in ventilation engineering and in building construction have made it possible to safeguard mankind from the vagaries of weather and from unwholesome indoor conditions.

Investigations into the effect of weather upon mortality in various seasons of the year make necessary that the element of normal seasonal variation be understood and properly provided for in the calculation. Thus, if a January rate of 10.1 is followed by a February rate of 12.3 per 1,000, the question is how much of this increase is due to normal seasonal variation and how much to some other but unusual mortality factor. It is possible that there may have been an exceptional increase in the February deathrate due to an outbreak of an epidemic disease or to unusually severe weather conditions. The influence of any such exceptional factors can be measured approximately by determining the extent to which the increase in February over January exceeds the expected month to month rise usual in these two months. It is, therefore, necessary that a method be outlined by means of which it is possible to eliminate the effect of normal seasonal variation from month to month. It is the purpose of this note to direct attention to a simple method of effecting this result.

*Metropolitan Life Insurance Company, STATISTICAL BULLETIN, February, 1923, Page 6.

The first step in this method is to obtain an index of seasonal variation of the mortality rate for each month, using for this purpose successive monthly mortality readings for say, five years. This index is computed in four simple steps: (1) the twelve-month moving average of the deathrates is centered at the seventh month; (2) the percentage of actual deathrate to the moving average is calculated for each month; (3) an average of these percentages is computed for each calendar month; (4) these twelve averages are adjusted to total 1,200, and constitute the seasonal index. This method is illustrated in detail on pages 1416-1417, of the *Federal Reserve Bulletin*, December, 1922.

The indices resulting from such computations are shown in the following table for three groups for which we had suitable original data:

Indices of Seasonal Variation of Mortality. Metropolitan Life Insurance Company, Industrial Department, New York State (Ages One and Over) and New York City (Ages One and Over), 1920 to 1923.

MONTH	Mean Deathrate per 1,000. All Causes.			Index of Seasonal Variation		
	M.L.I.Co. Industrial	N. Y. State (Ages One and Over)	N. Y. City (Ages One and Over)	M.L.I.Co. Industrial	N. Y. State (Ages One and Over)	N. Y. City (Ages One and Over)
January	10.1	12.9	12.5	109	110	113
February	12.3	16.7	16.4	118	134	139
March	12.7	13.6	12.7	129	122	125
April	10.3	12.4	11.5	108	110	112
May	9.3	11.4	10.5	102	108	103
June	9.3	10.2	9.4	100	91	93
July	7.9	9.2	8.1	85	81	78
August	8.1	9.2	8.0	88	81	78
September	7.6	9.1	8.0	83	83	79
October	7.9	9.8	8.7	86	87	84
November	8.2	10.5	9.6	92	94	95
December	9.0	11.1	10.3	100	101	103

The index may be interpreted as follows: for January, based upon the detailed records of the four years 1920 to 1923, the average rate for that month was computed to be 109 per cent. of the rate which would prevail if seasonal variation were not a factor in mortality. By dividing 109 into the actual rate for a given January (10.1 per 1,000), we find that the "norm" rate would be 9.3 per

1,000. Conditions characteristic of that particular January produced, therefore, an excess deathrate of .8 per 1,000, or 8.6 per cent. If the actual rate in the succeeding February were 12.3 per 1,000, division of this figure by the seasonal index, 118, produces a "norm" rate, free from seasonal influence, of 10.4 per 1,000. The excess ascribable to seasonal factors in that February was, therefore, 1.9 per 1,000 or 18.3 per cent. This system of calculation can be carried through for each calendar month in the series of deathrates under review and the absolute or relative excesses or deficiencies determined.

HEALTH RECORD FOR APRIL, 1924.

The course of the deathrate in April, this year, was unusual. Instead of the customary decline as compared with March, a considerable rise was registered. It is very possible that this is a reflex of the unseasonable weather conditions that have prevailed this Spring.

Increases were recorded, as compared with March, for organic heart disease and tuberculosis. Among other conditions, which, although not important numerically, are still of major public health interest, for which the deathrate increased in April, are measles, scarlet fever, whooping cough, diarrheal complaints, and puerperal diseases. In the cases of most of these, the deathrates were also higher than in April a year ago. Declines, as compared with March, were recorded for diphtheria, cerebral hemorrhage, pneumonia, and Bright's disease. The leading cause of death in April was pneumonia. This registered a slight decline as compared with March, but at the same time recorded an increase of 26 per cent. over the figure for the month of April, a year ago.

In the field of violent deaths, rather sharp rises were recorded for suicides and homicides, as compared with March, and the rate for each was higher than for April of last year. The record for accidents, however, is more encouraging. There was a seasonal increase over the mortality of the preceding month, but a pronounced decline as compared with conditions a year ago. Automobile fatalities present the usual discouraging picture. The increase over the March figure was one of nearly 50 per cent. and there was a rise of 12.5 per cent. from the mortality of April, 1923.

The general deathrate for the large cities of the United States during April was 14.4 per 100,000 estimated population. This is a trifle lower than the rate for the previous month and practically identical with that for April, 1923. Increases in case prevalence

were reported in April, as compared with March, for smallpox, typhoid fever, and malaria. There was less diphtheria, influenza, measles, poliomyelitis, scarlet fever, and whooping cough. Compared with April, 1923, there was more measles, malaria, poliomyelitis, scarlet fever, smallpox, and typhoid fever, with fewer cases of diphtheria, influenza, and whooping cough.

Severe outbreaks of scarlet fever were reported from Middletown, Ohio, and Tavistock, Ontario. In the latter town an order was issued April 11th closing all churches in the village until further notice.

Smallpox, during the first three weeks of April, showed increased prevalence in Alabama, Indiana, North Carolina, and Texas. In the country as a whole there is more of the disease so far this year than last. There was an outbreak in Hammond, Ind. In Indianapolis pupils were required to present certificates of vaccination following the spring vacation. This action was taken after twenty-four new cases had been reported, and about 70,000 children were vaccinated. At Fort Wayne, the Board of Public Health issued a warning against the possibility of a general outbreak. About twenty cases were under quarantine. In New Britain, Conn., up to April 21st, five deaths had been reported out of forty-one cases. This indicates a virulent type of the disease. On April 12th, the Detroit Health Department announced that although the total number of cases reported each week was gradually falling off, the situation was more serious than a month before because several of the recent cases were of the hemorrhagic type. Eighty-five cases were reported in a single week, which is the largest number during a similar period in many years. In Bay City, Mich., orders were issued to vaccinate all school children because of the discovery of a number of cases in a section of the city. The week of April 6th to 12th brought the highest number of cases ever reported in California during a single week (399).

An outbreak of typhoid was reported from Middletown, Ohio. It developed that all except one of fourteen suspected cases occurred in families receiving milk from one source.

The Table on page 11 shows the mortality among industrial policyholders for April, 1924; March, 1924; April, 1923, and for the year 1923.

METROPOLITAN LIFE INSURANCE COMPANY.

Deathrates† Per 100,000 for Principal Causes, Premium-paying Business in Industrial Department. (Annual Basis.)

MONTHS OF MARCH AND APRIL, 1924, AND OF APRIL, 1923.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED†			
	Apr., 1924	Mar., 1924	Apr., 1923	Year 1923*
TOTAL—ALL CAUSES	1047.2	1018.9	1040.3	923.9
Typhoid fever	2.7	2.1	3.9	5.1
Measles	14.4	13.9	13.5	9.4
Scarlet fever	6.5	4.8	6.6	4.4
Whooping cough	11.3	9.0	7.8	7.4
Diphtheria	12.3	15.3	12.5	15.5
Influenza	28.3	29.7	49.7	30.2
Tuberculosis (all forms)	117.2	112.1	121.3	109.6
Tuberculosis of resp'y system	103.3	101.2	110.7	99.2
Cancer	71.1	68.4	75.8	71.5
Diabetes mellitus	16.4	16.5	21.6	15.9
Cerebral hemorrhage	58.8	67.6	67.1	61.0
Organic diseases of heart	143.5	135.8	141.5	126.7
Pneumonia (all forms)	144.4	150.3	114.5	83.5
Other respiratory diseases	18.6	16.4	16.5	13.9
Diarrhea and enteritis	20.3	17.9	12.4	28.1
Bright's disease (chronic nephritis)	73.7	75.1	79.5	68.5
Puerperal state	19.3	17.0	18.3	17.6
Suicides	7.9	6.2	7.1	7.3
Homicides	7.3	6.3	6.7	7.2
Other external causes (excluding suicides and homicides)	51.3	50.2	56.2	62.7
Traumatism by automobile	12.6	8.7	11.2	15.2
All other causes	221.7	204.4	207.8	178.6

*Based on provisional estimate of lives exposed to risk in 1923.
†All figures include infants insured under one year of age.

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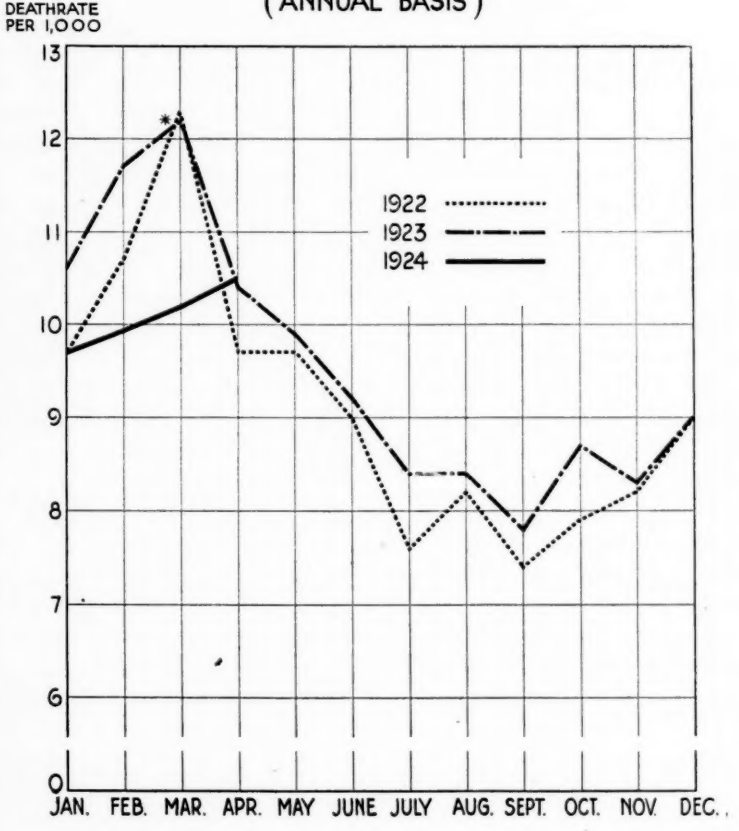
DEATHRATE PER 1,000
in SPECIFIED MONTHS *of*
1922, 1923, 1924

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1922	1923	1924		1922	1923	1924
JAN	9.7	10.6	9.7	JULY	7.6	8.4	
FEB.	10.7	11.7	9.9	AUG.	8.2	8.4	
MAR.	12.3	12.2	10.2	SEPT.	7.4	7.8	
APR	9.7	10.4	10.5	OCT.	7.9	8.7	
MAY	9.7	9.9		NOV.	8.2	8.3	
JUNE	9.0	9.2		DEC.	9.0	9.0	

* Beginning with March, 1923, figures include mortality of infants under one year of age.

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